

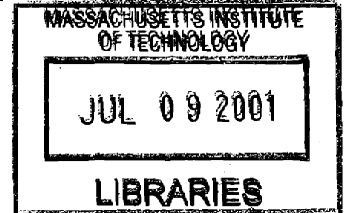
**Telecommunications service and expense management in US businesses  
- An Analysis of the Telecom Supply Chain and the Impact of Internet Tools**

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**Submitted to the Sloan School of Management  
in Partial Fulfillment of the Requirements for the Degree of  
Master of Business Administration**

**Dewey**

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**Abstract**

Spending on telecommunications services is the second largest non-production expense in most industries, the first position being taken by IT expenditure. Despite this, US businesses face several problems in managing telecommunications services and expenses due to the dynamic telecom environment, voluminous and numerous bills received from several carriers across geographically dispersed client company locations, difficulty in implementing internal cost tracking mechanisms etc. This thesis opens with a detailed description of these issues, highlighted through the results of a market survey of telecom managers. A case study of telecom management practices within the Boston location of Manulife Financial, a large insurance firm with several locations in the US and Canada is also used to provide a real-life example of a large business plagued with these issues.

We then proceed to probe for the sources for these problems through a detailed analysis of the telecommunications services supply chain. The impact of information flows in such supply chains, the players operating in each segment, their roles and outlook for the future are discussed.

Based on all of the above, a new service is proposed to solve some of the issues mentioned in the initial section of the thesis. This service is intended to drive optimization in telecom procurement and management for US businesses. We conclude by providing a detailed business plan for the rollout of this service.

**Thesis Supervisor:  
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## **Introduction and Thesis Outline**

This thesis concerns a virtually universal and growing problem faced by most US business today, namely that of managing telecommunication service infrastructure and expenditure. The issues faced, causative factors, and a possible solution to the problem are comprehensively presented here. This document is structured and presented in four distinct sections:

Section 1 deals with a general description of the issues encountered in managing telecommunications for US businesses. The results of a market survey with responses from over 250 telecom managers at US businesses are used to illustrate the observations.

Section 2 is a case study on telecommunications management practices at the Boston office of Manulife Financial, a large insurance firm with locations in Canada and the US. This section is used to provide a real-life example to the problems described in Section 1 of the thesis.

Section 2 deals with tracing the problems in telecom management discussed earlier to specific segments in the telecommunications service supply chain. In this context, this section opens with a generic description of service supply chains, and proceeds to analyze the impact of technology and information flows in such chains, and concludes with an introduction to the telecom service supply chain, the players in each segment, and their role.

Section 3 revolves around the discussion of a new web-based service proposed to resolve many of the issues identified in Section 1. The value proposition of such a service is analyzed in the light of competition and market dynamics and a detailed business plan is presented to document the fundamentals of launching such a service.

### **Section 1: Problems in managing telecom today and causative factors**

#### **Market research: results and analysis**

The telecommunications industry involves complex regulations, technologies, and pricing structures. Successive rounds of deregulation, including the Telecommunications Act of 1996 which allows all telephone carriers to sell both local and long distance calling services, have led to increased competition, driving prices down for long distance and local services. The result has been a proliferation of strategic alliances and mergers among companies with complementary assets. Despite this industry consolidation, a myriad of new telecom providers

is emerging, particularly in the fast-growing internet-access, data service, and CLEC sectors. Industry experts predict that corporate consolidations will take time to translate into actual consolidation of services for end-users. Differences in ERP systems, billing formats, and management teams will clearly lead to long and expensive integration efforts among merging companies.

As a result, the management of telecommunications for medium to large US businesses is a daunting task in today's environment. The problem assumes even greater importance given that telecom spending is typically the second largest non-production expense in most industry verticals, with IT expenditure taking the first position. According to a Cahners group report, telecom spending accounts for nearly 17% of non-operating expenses (all expenses except payroll, advertising and COGS) in a typical US business.

When referring to telecommunications expenditure, it includes landline voice service, wireless service, internet-access service, and data service. Current US business telecom spending is \$100 billion annually, expected to reach \$240 billion by 2003 (Source: IDC and Dataquest). Telecommunication spending varies significantly by industry, and the employee numbers presented below may not be accurate for industries such as the financial, insurance and banking sectors, or the consulting industry that are high users of telecommunications though their employee number may be low compared to other verticals.

<b>Size of company (# of employees)</b>	<b>Annual telecom spending (\$ bn)</b>	<b>Number of firms</b>
1 to 249	47	10,200,000
250 to 999	20	42,000
Over 1,000	34	6,500

*(Source: IDC and Dataquest)*

A recent and extensive market survey (facilitated by Zoomerang – an online market research firm) with responses from more than 250 telecom managers at medium and large corporations nationwide yielded interesting results (presented in appendix). The analysis of these results

highlighted some of the common issues plaguing US corporations as regarding telecom management.

94% of telecom managers said that they are swamped with huge bills in varying formats from different carriers for different services and across different business locations. There is little visibility into consumption and therefore spending. Internal telecom expense management is cumbersome since there is little information flow between the tiers of employee, cost-center, and corporate management. To aggravate matters, the telecom market is highly dynamic in terms of changes in the services and pricing schemes offered. Contractual obligations and a perceived risk in trying new services or carriers add to the complication.

While 97% of telecom managers at the surveyed companies feel the need for third party help in managing telecommunication expenses, 98% of them are unaware of any unbiased service that meets this requirement, and 99% of telecom managers would consider using such a service if it were available. When cross-tabulating these results with the size of the company, it appears that the larger the organization, the bigger the problem.

The following issues faced by telecom managers surfaced from the survey and we list them in order of perceived importance.

(i) Understanding a voluminous bill

Carriers usually provide hard paper copies of monthly telecom bills. For a medium sized business, this bill usually runs into a few hundred pages in length. The sheer volume of information makes these bills almost impossible to read. Some carriers do provide bills in electronic format. While data access is facilitated the software packages provided to view and analyze the data are extremely complicated and un-user friendly. Learning how to access and manipulate the information is so cumbersome that few telecom managers ever make the effort to do this.

(ii) Many billing formats and lack of transparency in price/consumption

A carrier typically uses multiple billing systems for different services that it provides, even if the bills are ultimately meant for a single customer subscribing to all these services. These systems are often incompatible and result in a client receiving multiple bills with multiple formats. In addition, there is little transparency that carriers provide on these bills regarding the prices

charged and total consumption for a client. For example, to find this information for voice service, the telecom manager will have to perform complex calculations and figure out what the company has been charged both on a per minute basis and as a total amount.

(iii) Tracking errors in billing and internal telecom expense management

A report by Windfall Associates, a Massachusetts-based telecommunications consulting firm, shows that billing errors occur in roughly 45% of all bills and that curiously, they are always in favor of carriers. The errors arise due to the fact that it is difficult to keep track of billed rates and offerings and compare them to those in the contract signed with a carrier. Even if this cumbersome exercise of comparison and error tracking is performed, it is a daunting task to make the claims on these billing errors, obtain a refund, and ensure that the mistake is not repeated.

(iv) Multi-carrier requirement for different telecom services

As shown by the survey results in the appendix, 80% of companies use more than one carrier, the average being 3 carriers per company. Each carrier uses different billing formats and bill transmission methods. As a result, client companies are faced with the challenge of aggregating and comprehending all this information. This usually implies a lot of internal resource utilization or spending vast amounts of money on external consultants.

(v) Geographic dispersion of the business

Medium and large corporations often have multiple locations. When billing several locations, carriers usually send the different bills to the different locations although a common contract might have been negotiated across these locations. Aggregating the billing information across locations is one challenge, but ensuring that the different locations are aware of a central agreement if there is one and tracking billing discrepancies is an even greater issue.

(vi) Dynamic market both in terms of services and price offerings

The prices and technical offerings in the telecommunications market changes very often. Competition drives costs down and continuous technical innovation drives a steady introduction of new products in the market. Client companies are faced with the challenge of keeping track of and understanding these changes.

(vii) Difficulty in forecasting demand (e.g., network capacity requirements)



Telecommunication demands in the future are often difficult to estimate for a telecom manager. This is because such forecasting requires visibility into the strategic direction and growth expected in the company. Given the non-operational status assigned to telecommunications management, telecom managers are rarely involved in the real strategic issues and growth expectations of the company. As a result, they have little understanding of their organization or its telecom consumption, in the light of making forecasts.

(viii) Perceived risk in trying new services or carriers

Telecommunication managers often lose their jobs if they make a single wrong move given how vital telecom is to a company and its employees. Just as no IT manager was ever fired for using IBM in the 1980's, no telecommunication manager today is fired for using AT&T. Trying new carriers or services is naturally perceived as a high risk move by these telecom managers. Even if an existing carrier offers a new service (e.g., DSL Internet access over T1 lines), telecom managers are wary to make a change to their existing infrastructure. Employees would hardly be understanding if they needed to last a day without telephone or Internet service, just because the company was trying a new technology. As a result, companies tend to stick with the same carrier for long periods of time and are reluctant to change in the least.

As far as industries go, consulting and financial services that are among the highest users of telecommunications, tend to be most aware of these issues and making efforts to manage them. From a discussion with Don D'Avignon (Telecommunications Manager, American Express), it was obvious that he was only too acutely aware of these problems. He estimated that Amex could gain up to \$2 Million a year just from simple auditing of its telecom bills. Various internal software initiatives and external consultants were used to tackle the problem, but there was no comprehensive solution available to these large organizations as yet. To illustrate the issues that we have touched upon above, we will now proceed with a case study of a large financial organization with locations in USA and Canada.

## **Section 2: Case study of Manulife Financial, Boston and US divisions**

*All the information documented in this case study on Manulife was gathered at an on-site interview involving the thesis authors and Nancy Hamel (Head of US Strategic Procurement), Dave Minori (Telecom manager of the Boston division), and Ciara Gogan (Assistant to Dave Minori and telecom analyst in the Boston division).*

Manulife Financial is a leading global provider of financial protection and wealth management products, including life insurance, pensions, annuities and group benefits, in Canada, the United States, and Asia. It is Canada's largest life insurance company as measured by balance sheet assets, net income and shareholders' equity, and has the largest market capitalization of any publicly traded life insurance company in Canada. Headquartered in Canada, Manulife Financial has more than 28,000 employees and agents in 15 countries and territories worldwide.

Manulife's Boston office has approximately 500 employees. Manulife's Boston division spends about \$1.2mn in telecommunications services per year and fits into the category of 'large' company as per our earlier market analysis and research.

Manulife hired Nancy Hamel to lead US strategic procurement in early 2000. Nancy is now championing a two-year project to streamline purchasing within the organization that will lead to significant savings. Nancy started with areas such as office supplies and computers and is about to embark on a similar process for telecommunications service procurement as well. This involves more coordination across geographies, in particular more communication between the US and Canadian offices.

The Boston division of Manulife that was analyzed for the purpose of this thesis has about 10 people working on telecommunications management. Most of the day-to-day tasks of this division is the issuance of tickets for employee reported telecommunications problems and in helping the resolution of these tickets in a diligent manner. Tickets cover problems for both voice and data lines. Examples of such problems are the recovery of lost/forgotten voice mail passwords, phone installation and de-activation, the ordering of a new cell phone or pager, a data line that is down etc. Some time is also spent on supporting the telecom infrastructure through billing, budgeting, and the management of telecom suppliers. Although most of the ticketing tasks are handled through an automated and reliable ticketing system and by the telecom team, many of the day-to-day problems faced by this team are due to system and process redundancies, poor system tracking of certain tasks, and frustrations in dealing with carriers.

### **Process redundancies**

Process redundancies happen when employees need to repeat the same task multiple times in order to respond to the needs of the company. Below are some examples of the process redundancies faced by Manulife and some suggestions on how they can be solved.

### *Phone installation*

When a phone is installed for a new employee, his or her extension must be entered in several directories for easy reference. The telecom team has to enter this information into the paper directory, the user directory, the lobby directory, the PBX or switch of the company, and finally into the telecom directory that tracks all available extensions. The task of entering the name and phone number of the newly hired employee is therefore repeated 5 times in 5 different systems. A simple solution is to have a common data-entry interface leading to significant time savings.

### *Phone deactivation*

When an employee leaves the company or moves within the organization to another physical location, his or her telephone, cell phone, calling card, and pager need to be de-activated. The problem is that on average, the telecom department is notified 3 months after an employee has left the company. When an employee leaves the company, the human resource department has to file a termination of employment form, then an IT termination for email purposes, and finally a phone termination form. Human resource staff often fills the first two forms and because IT and phone systems are often integrated in one department, assume that the IT termination form is sufficient to get all the phones for this employee de-activated.

### *Carrier billing*

Every month, the telecom department of Manulife receives bills from their carriers, in this case mainly from AT&T. Manulife receives both paper bills and electronic bills on a CD. Ciara Gogan is in charge of reviewing the received bills and submitting it to David Minori and other managers for approval. In order to track the bills and look for spending patterns, Ciara uses a Microsoft Excel spreadsheet where she manually re-enters significant items on the bill month to month. This process is very time consuming and can only detect mistakes that result in a large discrepancy between one month and the next. This process is redundant because Manulife already receives bills in two formats and yet needs to create a third one to be able to understand their content.

### *Frustrations in dealing with carrier account representatives*

Since they are a large account for AT&T, Manulife benefits from monthly meetings with AT&T's account representatives for the different services it subscribes to (voice, data, calling cards and cell phones). These meetings are intended to discuss service problems encountered during the

past month and reach a quick resolution. Unfortunately, Manulife has not found these account representatives from AT&T to be very responsive. The Manulife telecom team often needs to repeat the problem description over several monthly meetings and still receive little response. Many factors can explain this situation. First, there is a very high turnover in the account representative staff at AT&T. Manulife sees new account representatives on average every four to six months. Secondly, the account representatives have no incentive to provide better service to their clients as they are compensated on the basis of new clients signed on rather than on customer satisfaction. Manulife is not required by AT&T to evaluate the performance of these account representatives, and there is, as a result, little incentive for any account representative to do his or her job properly.

An example of Manulife's experience in dealing with AT&T would highlight the frustrations mentioned above. Manulife wanted to block employees from using the automatic call feature at a cost of 35 cents per call available as an option when using the 411 directory assistance feature offered by AT&T. They preferred that employees use 411 to find a telephone number and then manually dial it at the lower rates negotiated on the contract. This simple request involved a 14-month wait on Manulife's part and several repeated discussions with the account representatives before being resolved since it was to the advantage of AT&T to charge higher rates. The AT&T account representative changed twice in the meantime, and each blamed his/her predecessor for the lack of responsiveness. Finally, when Manulife took matters into their own hands and persisted in calling the account representative about this every day, the 411 automatic dialing was blocked. It was still however only blocked for the local directory assistance and not for the 800 directory assistance or for calling long distance.

Manulife perfectly understands how overwhelmed an account representative can be with multiple demands on their time and how poorly they are incentivized. The Manulife telecom team has but simple expectations of the representatives and only requires that they report periodically on the status of requests and a timeline for resolution.

### **Poor system tracking**

*Who has what? And who is allowed what?*

For employee telecommunication device management i.e., for calling cards, pagers, and cell phones, Ciara Gogan and Dave Minori's group have created an "informal database" using Excel that matches phone numbers and employees. However, they have no information on

employees who obtained these devices prior to Dave's or Ciara's arrival at Manulife. This is an information gap that is very difficult to fill given the large number of employees in their division and the time they can allocate to such a task. The resulting problem is that they receive bills for calling cards, pagers, and cell phones that supposedly belong to Manulife employees and this something that they have little means to verify.

There is no clear approval process for employee requests to purchase telecom devices and options. Today, it is basically up to Ciara's discretion to approve or deny a cell phone request. There is no formal policy about who is allowed to have one and what calling plan should accompany it. Such decisions are based on the title of the person in the firm rather than on their usage or location. Also, the request is always directed to the same vendor and the same plan is used no matter what the usage of this phone is going to be. There is clearly room for a rigorous process that would pre-qualify employees for a cell phone request and automatically select a plan that would best match their actual consumption.

#### *Cost Accounting*

For the time being, the accounting for telecommunications expenses within each department of Manulife is done on a per head basis. The information required to break this down more accurately among departments and cost centers is available in the PBX of the company, but the reports from a PBX are as voluminous as telecom bills and even more difficult to read. As a result, local departments with little telecom expense get charged as much as heavy telecom-user departments such as the Asia group, on the basis that both departments have roughly the same number of employees. A tool that would be able to read both the telecom bills and the PBX reports would enable Manulife to better understand its internal cost structure and relate revenues to costs. It would also enable such a client-oriented company to better bill back telecom costs to its clients when necessary.

#### *Price information/ Contract monitoring*

The telecom manager's role is largely dependent on their personal work style and preferences since there is little documentation on these practices that passes down from manager to manager and ensures continuity in tasks. For example, Dave Minori took over from the previous telecom manager at Manulife about in mid 1999 and has no information about the long-term AT&T contract that was negotiated by his predecessor. As a result, he could not check the accuracy of the bills received by Manulife during his early tenure in the company. In addition,

this information is very difficult to obtain from the carrier as it is to their advantage to leave clients with as little information as they can. Dave had to wait for this information until the Manulife contract ended and he could re-negotiate a new contract that is the current basis for reviewing bills every month.

## **Managing suppliers within Manulife**

### *Service level agreements*

According to Nancy Hamel, head of US strategic procurement for Manulife, the same frustrations and information gaps that arise with telecom apply to other kinds of procurement such as IT (computers) and office supplies as well. The key success factor in managing the relationship with suppliers is comprehensive service level agreements. Vendor management combined with increased communication with suppliers is key to a successful client-vendor relationship. According to Nancy, "One needs to move away from a relationship where you meet occasionally to report problems. The relationship needs to become one where frequent interactions lead to reliability and reliability to trust." Having service level agreements forces both side to commit on a process for problem resolution. Open discussions with clients about areas for improvement and successfully managing client expectations puts suppliers in a much stronger position, whereas intuitively one would assume that service level agreements protected only the clients. Increased communication from the supplier tends to calm buyers down and have them react positively to "unexpected problems". "All we need is a regular up-date on the status of our queries", says Ciara Gogan.

### *Centralized purchasing*

Nancy Hamel joined Manulife to establish a centralized procurement function for all non-operating supplies. She has already built this function for office supplies, and the process was to build an internal software that would catalog all vendors. " We considered procurement platforms such as Ariba or Commerce One, but most of the firms we talked to said that these systems were behind on delivering promised results and we were unable to find a real success story." As a result, Manulife elected to build its own procurement software and is not using an off-the-shelf package. Nancy also mentioned the complexity of starting to use "yet another system". Learning how to use a new system and maintaining it comes at a cost, and these costs are much higher for off-the-shelf software packages than for internally built software ones.

The causative factors for the various problems mentioned above will now be discussed in the context of supply chain analysis, whereby they can be traced back to different segments of the telecom supply chain. It is important that we first understand the dynamics of a generic service supply chain before we proceed to analyze the telecom supply chain in particular.

### **Sections 3: Supply chain analysis**

#### **Introduction to Supply Chains**

A traditional supply chain is a related network of businesses that obtains raw materials, converts them into intermediate goods and finished goods and then delivers these goods to clients. Various customer channels comprising a distribution system are used for the delivery of the finished goods. There is a flow of information, goods and payments along the supply chain. Supply chains exist in virtually every industry, but are especially apparent in manufacturing industries that have an obvious flow of goods from suppliers to manufacturing facility to end-customers. Managing a supply chain is a non-trivial task since it involves a large amount of coordination and logistics planning among diverse entities that are geographically dispersed. The biggest challenge is coordinating inventory and production capacity across these organizations in the supply chain network, given the fluctuating demands at the end-customer level. In the traditional manufacturing context, the metrics normally used to gauge supply chain performance are inventory levels, procurement costs, and order fulfillment time.

With lack of information across the supply chain components in the past, procurement managers focused on streamlining operations only within their domain. It has now become apparent that this need not translate into an optimal solution for the supply chain as a whole. Modern supply chain management techniques tend to study the entire supply chain from end-to-end optimizing in a more comprehensive manner. This streamlining of operations all along the chain leads to process efficiencies that translate into cost savings, better products, and improved customer service. This is easier said than done though. Challenges arise because each of the components/firms along the supply chain act in their own interest and are subject to different constraints. Though it is apparent that they are dependent on each other and that it would be to their mutual benefit to align goals, the actual incentives to cooperate and coordinate effort continues to be a challenge.

## **Service chains versus physical product chains**

While supply chain management systems are usually associated only with manufacturing industries and inventory-management issues, they are increasingly becoming applicable to service industries like telecommunications and utilities where the items traded are not inventory-able. This is because cost reduction through process efficiencies represents one of the primary vehicles for firms to achieve a competitive advantage, regardless of the industry. Streamlining procurement functions and increasing visibility into consumption/spending immediately translates into cost savings for clients. To identify these cost savings, procurement officials need access to relevant cost information to make effective cost comparisons between various activities. Businesses have increasingly focused on driving process efficiencies in procurement within their own organizations and in their dealings with external suppliers/distributors to drive cost reductions. These efficiencies also contribute to product improvement and better customer service that give the business a competitive advantage and source of differentiation from its competition.

The reason service industries lagged manufacturing industries in implementing supply chain management systems is probably because manufacturing industries already tend to have much of the raw data (inventory data, procurement cost data, supplier performance data etc.) available in electronic databases. When the data is available, it is of course easier to manipulate it for decision-making. This lack of data within service companies was not an issue in a regulated environment. With the deregulation of service industries like utilities and telecommunications in the 1990s, the number of vendors has increased dramatically, intensifying competition. The need for information to facilitate decision-making, performance control, and coordination effort is increasingly apparent in this deregulated, competitive environment.

### **Information use for control (incentives), coordination, and decision making**

The traditional supply chain challenges of coordination and incentive alignment are equally relevant in the service industry context as well. We will highlight this with two examples in the telecommunications and utilities industries respectively.

- In the early 1990s, telecommunications firms like AT&T and MCI began using external sales agencies for customer (consumer and corporate) marketing efforts. These agents were



compensated on a per transaction basis i.e., for each 'switch' made from another carrier to AT&T or MCI. The agents in turn resorted to 'slamming' customers and switching them without their consent from an existing carrier to AT&T's or MCI's service. This had an adverse impact on AT&T and MCI both from a customer loyalty perspective and from a cost perspective since FCC regulations have since made 'slamming' illegal and involved customer compensation from the new carrier. Both AT&T and MCI have since ceased to use external sales agencies for marketing efforts. This is a striking example of control or incentive alignment issues in a supply chain.

- The recent energy crisis in California is another example of mis-aligned incentives on the supply chain. The leading energy retailers in the state - Edison and Pacific Gas & Electric paid more for wholesale power than they could charge residential and small-business customers. These customers are covered by a rate protection plan that followed the electricity deregulation in 1998, when wholesale power prices were low. The price protected was implemented to force consumers to pay artificially high prices and to give the utilities the time and resources needed to pay off debts left from their days as regulated monopolies. That plan backfired in the summer of 1999 when the cost of wholesale power soared, but retail prices remained frozen. Edison and PG&E are rearing to collect the deficit from customers since they now want to be compensated for the power that they buy at a higher cost. While wholesalers enjoy large margins, and end-customers enjoying price protection have little incentive to conserve energy, the middle node on the supply chain i.e., the utility retailers are getting squeezed.

The availability of relevant information in real-time is a key driver in tackling these issues.

Information along the supply channel can help in three ways:

- **Control/performance evaluation:** When information about the performance parameters of different entities in a supply chain network is available, it is easy to identify which components are aligned in their incentive for overall supply chain optimization. For e.g., tracking order fulfillment time from various suppliers can help identify those that are most responsive and that can be included in a 'preferred vendor' list.
- **Coordination:** For obvious reasons, coordination is facilitated on the supply chain through information. In the mobile telecommunications context, here is an example. AT&T's mobile

service plan for customers falls into several categories depending on their usage profile (geographic location, consumption volume etc.). Information revealed about the customer's usage patterns over time helps AT&T suggest alternate plans that the customer could consider that better fit their requirements. This is optimal for both AT&T and the customer because the customer gets a better solution and potential cost savings, whereas AT&T gets a more loyal customer and lowers customer churn.

- **Decision-making:** Relevant and updated information about entities on the supply chain is vital in decision-making, especially in the procurement context. The decisions could range from a simple adjustment of purchased service volume, price, vendor selection, and in contract re-negotiation with service providers. Access to third party ratings and reference information can also drive optimal decision-making and mitigate the underlying risk for managers.

### **Information aggregation, analysis, and transmission**

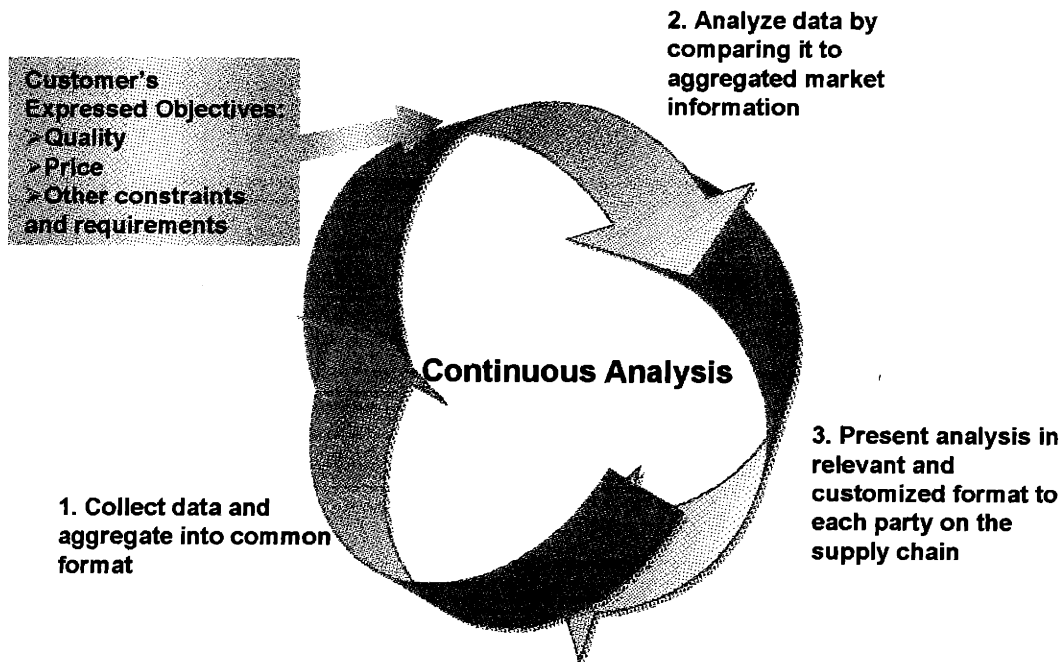
While the benefits of information flow across the supply chain are apparent, the three steps to obtaining this information are presented below.

- The first step in setting up information flow is aggregation. In service procurement, aggregated information should be obtained across suppliers, across related services, across geographically dispersed locations/cost centers, and over a period of time. The aggregated information should be in a common format and with common parameters that facilitate collation and analysis. Pertinent market data about new product/price offerings, service ratings etc. can also be aggregated at this stage to create a more informed basis for decision-making.
- The second step in information facilitation is analysis. It is at this stage that market data and data from the supply chain is studied to create valid recommendations for process improvement and cost cutting efforts.
- The third step is the actual transmission and presentation of the information. The hardware requirement is the actual transmission mechanism and bandwidth. With broadband data access becoming more and more common, hardware is less of a constraint in the current context than the presentation. The software problems that are usually encountered here are information overflow and customized presentation. Analyzed information may need to be

presented very differently to different parties on a supply chain. For example, while procurement expense tracking at a micro-level can help budgeting within a client business, a more macro view of the consumption may be relevant to the service providers to better price and customize their offerings.

It is worth noting that this cycle of operations in setting up information flow within a supply chain repeats endlessly and that the usage of historical data in analysis can help make this a self-reinforcing loop.

## Information Aggregation, Analysis, & Presentation



### Role of technology in supply chain information flow

The role of information technology (IT) in supply chain management is to help managers by providing them an informed basis for decision making achieved through data aggregation and dispersion across supply chain components. It is felt that this will result in better internal processes through better coordination and cost reductions achieved by giving decision-makers

the information necessary to optimize procurement. IT usage enabled supply chain management systems to transition from simple distribution management systems to a fully integrated system with the supplier at one end and the customer at the other. The IT-related entities that support this comprehensive supply chain are electronic data, higher bandwidth communications, and automated decision-support systems for planning and implementation. The recent explosive development of the Internet and communications technology makes it possible to have more relevant data on a real-time basis, and from several sources.

Access to information is facilitated through the IT infrastructure provided by technologies such as Electronic Data Interchange (EDI) and Application Service Providers (ASP). EDI, as a technology, refers to the computer-to-computer transmission of business information between firms in a supply chain. But, more importantly, EDI as an enabler of business process re-engineering, is the driving force for supply chain efficiency. ASPs are a completely new way to sell and distribute software and information services. The ease of implementing an ASP business model on the Internet has contributed to its incredible popularity in the recent past. ASPs have considerable advantages when compared to traditional information/software distribution channels. Here are some of the most important advantages:

- It lowers entry costs for small and medium sized businesses that may not consider the prohibitive cost of software implementation and maintenance.
- Even for larger businesses, IT personnel tend to be very expensive and outsourcing software applications is one way to reduce IT headcount.
- ASP models transfer the onus of hardware and software maintenance to the provider.
- The cost of providing Internet data bandwidth is shifted to the ASP and they can often provide it at lower cost.

An ASP model when linked to the enterprise IT systems of buyer and seller firms in a supply chain can help in aggregation, analysis, and decision-making aspects. The supporting infrastructure can also integrate intelligent market information about competitors and competitive bids on the Internet. Technology has driven a number of significant changes in the way supply chains in various industries are managed, very often leading to a shift in power from suppliers to buyers. Technology has in fact just had an impact on the transmission of critical information at the right time between the different players within the supply chain, acting as an information flow enabler and accelerator. The availability of relevant information in a shorter

time changed the dynamics of industry players' interactions in terms of market power and ultimately price. Whereas most applications of IT based SCM have been in physical supplies and inventory-able products, little was done for services supply chain management in general, and telecommunications services supply chain in particular.

### **Benefits of information flows in supply chains**

Information flow in a supply chain drives speed, coordination, and ready access to product information. These result in the benefits outlined below:

- (i) *Push versus pull mechanisms in manufacturing applied to service delivery:* As information flows move upstream from end-users in the procurement chain to the service provider's design segment, services are customized to meet individual requests. This trend is the key driver to gaining competitive advantage for suppliers as better service now refers to the ability to greater customization. The ability to track buying habits via the Internet in tandem with popular Customer Relationship Management (CRM) systems that are used by firms today reveal much richer customer information to suppliers than was ever available in the past. The cost of obtaining this information is also thus significantly lowered, thereby lowering the barriers to customizing offerings for customers.
  
- (ii) *Price reduction resulting from better information flows:* The Internet has made price shopping and comparison trivial for procurement managers, especially for commodity goods. Entire supplier catalogs are available online and auctions, open bids, and e-marketplaces are some of the mechanisms used today for price information access and procurement. It is not clear that price comparison facilitation is all good for either party involved in the transaction though. For suppliers, it has lowered the costs of entry and distribution, while at the same time squeezing their margins. For buyers, it can lower costs, but they also assume the risk of dealing with relatively anonymous suppliers.

With real-time access to relevant information, process integration between the decision-making systems of suppliers and their customers becomes bi-directional and tightly integrated. Suppliers and clients can interact dynamically and initiate automated decision-making processed within each other's information systems by pre-defining business rules. Less human intervention is required at each step, as these processes become more

automated and rules-based. This sets the stage for more intelligent business decisions to be automated. For example, pricing information available electronically from a supplier catalog can trigger a customer procurement system to automatically place an order if the price decreases beyond a pre-defined level. Another example - if one supplier's quality is seen as being above that of other suppliers, the customer's application might automatically move that supplier up in the vendor of choice list based on the defined business rules.

(iii) *Internal processes within buying organizations made clearer.* One of the clear benefits to information flow is that budgeting and cost accounting are definitely made easier. With price transparency and expense tracking measures, resource costs can be better assessed for individual transactions. Also, requirements are better tracked and therefore better budgeted.

The Internet can provide the necessary interfaces that support process automation between businesses instead of being limited to internal business transactions. The bi-directional flow of information creates process efficiencies through better coordination, decreases costs, and streamlines the way resources flow through the supply chain. This also increases customer loyalty and reduces churn, an area of deep concern for most service industry firms. Given that in most service sectors, customer acquisition is viewed as far more expensive than customer retention, the migration of businesses from transaction-centric to customer-centric seems inevitable. In today's e-business setting, suppliers are increasing the usage of the Internet to create tight links between all their information systems, both within their organization and in their dealings with supply chain entities. This move is a bid to increase customer loyalty through provision of information that aids decision-making for both parties.

Customer-centric e-business suppliers will compete not only on the price and quality of their products and services, but also on the quality of their information services and e-business links. Suppliers who operate within intelligent supply chains will be able to reduce cycle time, be more responsive, and improve customer service. Targeted marketing and customer segregation according to certain parameters is facilitated. Customer-centric computing breaks down barriers between suppliers and their customers and improves decision-making. Intelligent supply chains provide suppliers with a competitive edge.

With this introduction to supply chains, we will proceed to the next section, which analyzes the telecom service supply chain in detail.

## **The Telecommunications Services Supply Chain**

Telecommunications is one of the most dynamic industries in the United States economy. An annual survey of telecommunications service providers released by the Federal Communications Commission (FCC) found that industry revenue grew 9 percent in the year 2000 to \$269 billion, up from \$246 billion in 1999. New voice, data, and mobile services have created new opportunities in the overall market as consumers and businesses look for new ways to expand their information networks and, as a result, spend more money than ever on communications. While voice service (local, long distance, international calling etc.) is moving towards standardization in quality and price, telecom services such as data and wireless services still require substantial customization and are areas of huge growth. Voice services have now assumed a commodity status for consumers. For businesses however, voice service is still provided on negotiated rates based on a term-volume commitment from the client.

It is more meaningful to discuss a telecom service supply chain in the business rather than the consumer market, given the many parties concerned in managing complex bundles of telecommunications services for businesses. In the business telecom service supply chain, we have the service providers as suppliers at one end and the businesses as clients at the other. Telecom/network consultants, telemanagement firms, provisioning facilities, and external billing agents fill the intermediate positions.

The typical supply chain processes are as follows:

1. The customer contacts telecom carriers for initiating service.
2. A contract is drawn up and rates negotiated on a term-volume basis. A customer agent is assigned by the carrier to the customer to maintain the relationship and resolve any issues that arise.
3. The contractual details are recorded by carriers and the parameters for setting up service passed on to provisioning agencies.
4. Provisioning agents will facilitate the micro-processes required to actually initiate service for the customer and set up their billing records within the carriers' billing systems.
5. Service is initiated and the client starts to pay for monthly service. Billing may be done directly by the carriers or through external billing agents.

6. The customer uses either an in-house telecom department or external telecom consultants to review the bills and audit them for errors.
7. On an occasional basis, the customer will hire telecom or network consultants to review the telecom technical solution and make recommendations for improvement, contract re-negotiation.

We will now look at each entity within the supply chain and review their respective services, markets, competition, and future prospects.

### **Telecom Service Providers**

The US telecom service provider market is a concentrated group of suppliers with 5 players accounting for more than 70% of the total market. To give a brief history of US telecom service providers - until the early 80's, the Bell System and AT&T (the parent holding company) had a monopoly hold on telecommunications in the US. In 1984, the Bell System was dismantled into seven separate Regional Bell Holding Companies known as "Baby Bells." Deregulation increased competition and companies such as MCI and Sprint became strong forces in the market for long distance service. As telecommunications competition intensified over the 1990's and into the current decade, advancements in technology moved at an even faster pace. New technologies such as broadband high-speed data communication and mobile communication changed the face of the telecom industry. This caused the federal government to enact sweeping reforms in the Telecommunications Act of 1996. The Act removed the last barriers to entry in telecom service provision and spurred the entry of Competitive Local Exchange Carriers (CLECs) for voice service and cable television companies to offer data services.

While the industry is seeing several mergers and acquisitions today and some degree of consolidation, there is still little coordination in customer-facing processes even between merged entities. Legacy computer billing systems and a diverse range of underlying technologies further complicate these merger efforts. The only service providers that go some distance in responding to customer requests for service/bill aggregation are the CLECs though there is mounting pressure on the larger carriers to move in this direction as well.

### **Telecom Consultants**

The term 'telecom consulting' is used in a wide variety of contexts depending on the range of services implied. According to the Brookside Group's in-depth review of the highly fragmented



telecom consulting market, there are 2,700 telecom consulting firms that collectively employ an estimated 37,000 individual telecom consultants. There are several thousand telecom consultants in the US in firms ranging from single-person companies to large, established firms like Andersen Consulting, PricewaterhouseCoopers and Deloitte & Touche. Total telecommunications consulting revenues was \$7.4 billion in 1997, has increased at the rate of 15% each year through 1998 and 1999, and is predicted to reach \$11bn in 2000. Services are usually priced on a two-part tariff model with a one-time consulting fee plus 50% of one-year's savings on telecom procurement.

Businesses of all sizes are potential customers, depending largely on the size of the consulting firm and the scale of the cost structure. The usual services offered include:

- RFP development and support
- Vendor or carrier evaluations/recommendations
- Network/systems analyses & planning
- Product or service evaluations/recommendations
- Network/systems design
- Cost reduction consulting
- Client application hosting and web hosting

### **Telemanagement Firms**

Telemanagement firms mainly focus on bill auditing and aggregated billing. Several telemanagement companies exist in the US, but the only established firm with an established customer base is TeleManagement Technologies, Inc. (TTI). TTI focuses on PC-based telemanagement software systems. They are an offline service that provides the following services:

- Internal PBX/ACD chargeback, toll fraud detection
- Telecom RFP development for voice/data networks
- Telecom network contract negotiation
- Telecom network implementation
- Telecom bill auditing and validation
- Telecom network strategic planning
- Telecom staff outsourcing
- Consumption report generation

TTI makes money both from sales of its software and on a per-project basis for one-time consulting services. The software is priced according to the size and complexity of installation at client locations. Because of the high costs of consulting services that TTI offers, it mainly works with large clients such as 3Com, IBM, and Japan Airlines.

In general, telemanagement software prices range from under \$1,000 for small call volume call accounting packages to well over \$200,000 for a complete system of telemanagement applications. Pricing depends on the number of software applications purchased, average monthly call volumes, and the client's computing platform. Typically, mainframe and client/server telemanagement products cost far more than PC-based or stand-alone products.

### **Provisioning Agents**

The setting in place and configuring of the hardware (network, equipment etc.) and software (e.g., billing records) required to activate a telecommunications service for a customer is called provisioning. According to a recent Frost & Sullivan article on the US provisioning market, "The rapid rate of technological development has given rise to complex multi-vendor network environments which require significant skill and experience for efficient integration into legacy network systems." Frost & Sullivan Telecommunications Analyst Donna Pusey predicts that with the increased competition for the provisioning of network integration services by technology providers, telecommunications carriers and consulting companies, the ability to offer a total end-to-end solution that includes the effective management of an enterprise network will serve to differentiate market participants.

Many third party firms that provision telecom service and provide OSSs have mushroomed in the US. The leading OSS provider in the US is Telcordia Technologies and more recently equipment manufacturers and network companies like Lucent and Nortel are also entering this space in a bid for vertical integration. They provide consulting and management services in addition to provisioning the equipment and tools.

Operation Support Systems (OSSs) are computer systems used by telecommunication service providers to automate the essential business functions involved in provisioning service for customers. Since business clients normally use several carriers to provide their telecom service, carriers must be able to interconnect their OSSs in real-time with other carriers so that they can operate as trading partners. Multiple OSS products exist in the marketplace, many are

proprietary, and the standards in the industry are evolving.

According to Howard Andersen, President of the Yankee Group, "The Telecommunications Act of 1996 created a substantial and growing market for OSS interconnection solutions -- our estimates are that the market opportunity will exceed half a billion dollars by the end of 1999 in the US."

### **External Billing Agents**

According to IDC reports, telecom billing is an area carriers can no longer afford to ignore. By 2003, U.S. telecom billing industry revenues will reach \$9.68 billion. The importance of billing, and the growth in the market, is being driven by subscribers signing up for more and more services and demanding one bill, and by deregulation and intensifying competition creating the need for carriers to introduce new services quickly and be able to bill for those services. To deal with these challenges, most carriers today external billing agents. Some of the big names in this industry are Kenan Systems, Saville Systems, ALLTEL Information Systems, Cincinnati Bell Information Systems (CBIS). Computer Resources Management, EUR Datacenter, and more recently web-based billing companies such as CallVision. This industry too has seen large consolidation with carriers and equipment firms acquiring billing firms in a bid for convergence. For e.g., in January 1999, telecom giant Lucent Technologies purchased Kenan Systems.

### **Customers**

Corporate customers complete the supply chain in business telecommunications services. In the first section of the thesis we saw some of the issues that are pertinent to management of telecommunications within US businesses. A case study of telecom management within Manulife Financial was used to highlight these issues. The information hiatus both within tiers of a client company and in its dealings with external vendors is at the heart of several telecom management problems. In the second section of the thesis we elaborated on supply chain mechanisms and the US telecommunications supply chain in particular.

Given this background, we can now proceed into the third section of the thesis, which focuses on the business plan for a proposed new web-based service -- 'Booleo', intended to add efficiencies to the business telecom supply chain. Booleo attempts to resolve some of the incentive related issues in the telecom supply chain that causes the client-sided problems listed

earlier in the thesis. It fills vital information gaps in the chain and provides links that do not exist today between parties both internally within a client organization and in its dealings with external parties. This service addresses most of the main issues faced by US businesses today in managing their telecommunications expenses and services.

## **Section 4: The Business Plan**

### **Business Opportunity**

#### **The Industry**

The telecommunications industry involves complex regulations, technologies, and pricing structures. Successive rounds of deregulation, including the Telecommunications Act of 1996, have led to increased competition, driving prices down for voice services. The result has been a proliferation of strategic alliances and mergers among companies with complementary assets and the emergence of new telecom providers, particularly in the internet-access, data service, and CLEC sectors. Industry experts predict that it will take time for corporate consolidations to translate into actual consolidation of services for end-users.

The industry includes landline voice service, wireless service, internet-access service, and data service. Current US business telecom spending is \$100 billion, expected to reach \$240 billion by 2003.<sup>1</sup> Despite the fact that landline services are rapidly becoming commodities, the recent and predicted expansion of wireless and data services, the increasing complexity of carriers and service choices, and the changing structure of firms ensure that the potential market will continue to increase in size.

#### **The Company and Concept**

Booleo (meaning "I decide" in ancient Greek) provides a service that aggregates the total telecom costs and information of large companies, resulting in better management of their internal cost structure as well as better negotiation of prices with external suppliers. This is accomplished through a user-friendly web interface.

Businesses across the US spend billions of dollars each year on telecommunications services in an increasingly complex environment. Given the vast array of available services and providers, and lack of user-friendly bills, companies can only with great expense and difficulty understand

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<sup>1</sup> Source IDC and Dataquest.

their own consumption and begin to think about finding ways to improve internal processes. Armed with little useful information about their own spending and needs, these companies cannot negotiate with providers in a way that is most appropriate and beneficial for the company.

The Booleo solution provides a client company with the means to manage internal processes more efficiently and to strategically position itself vis-à-vis its external environment. Booleo provides:

- Aggregated, customizable, online bills (for all providers, services, and client sites)
- After-aggregation services such as bill analysis, call-tracking for billing clients, cost allocation
- The ability to manage telecom expenses and services to the employee level

Further, Booleo uses a client's profile and telecom consumption pattern combined with dynamic market information about telecom service offerings, technology and pricing to deliver:

- Recommendations of the most appropriate telecom service mix
- Risk management in trying new providers/services based on provider ratings, client references, and client profiling
- Information and tools for better negotiating contracts with service providers.

Given the growing complexity of telecommunications service offerings for businesses, it is not surprising that telecom procurement is replete with inefficiencies and uninformed decision-making. Despite consolidation in the market and the emergence of CLECs, companies still to have multiple carriers, especially for mobile telephony. Businesses purchasing telecommunications services waste valuable time making decisions based on incomplete information, and as a result pay high prices. Due to the absence of dynamic market information and credible references, these businesses also assume significant risks when trying new carriers or services.

Booleo is seeking to establish itself as the pioneer and leading provider of complete telecommunications expense management. Its patent-pending business model streamlines the procurement process, promoting process efficiency and cost reduction both within the client organization and in its dealings with telecom carriers. The Booleo solution will be available at two levels within the client organization – corporate (telecom manager) and cost-center levels. The decentralized Booleo solution promotes cost tracking and management enabling client

organizations to dramatically cut down on maverick telecom spending and optimize telecom procurement by capturing consumption information at different levels within the business. The wealth of information that Booleo captures and presents to a telecom manager drives informed decision-making and allows the manager to focus on value-added activities.

### The Booleo Product and Services

The Booleo service provides detailed information on telecommunication services spending resulting in greater efficiencies and savings both within the organization and when dealing with outside suppliers. Booleo aggregates and analyses strategic information that would not be used otherwise, leading to complete information management internally and to strategic procurement externally. Users of the Booleo service include controllers and CFOs eager to get visibility into their company's spending and to manage costs efficiently within each department or location of their company. It also includes telecom managers at all levels within the organization willing to better purchase telecommunication services. It achieves this through a cyclical process of three steps:

- 1) Data aggregation: Booleo captures procurement objectives at different levels in the organization and consolidates billing information across services, providers and client sites.
- 2) Data analysis: Using the aggregated billing information from step 1 and the client's objectives, Booleo analyzes the data through an intelligent search and match process.
- 3) Advice and action: Based on data analysis, Booleo provides valid recommendations for optimizing telecom procurement. Clients can then act confidently upon this advice.

### Features and Benefits

	<b>Current client situation</b>	<b>Booleo product feature(s)</b>	<b>Value to clients</b>
<b>Internal organization</b>	Maverick spending on telecom services/equipment	Expense/consumption tracking at all levels; centralized control over orders	Savings from cost-tracking and management at every level
	No easy bill-back to clients' customers (eg:consulting)	Cost tracking per client at employee level	Easy bill-back process. Savings from accurate bill-back procedure.
	No centralized source for telecom resources or information	Resource library with telecom contacts, news, information	Time savings from reduced search time for information

	Difficult to relate spending to cost pools for activity-based costing or forecasting	Cost tracking at the cost-center level	Accurate mechanism for cost-allocation and budgeting across cost-centers/departments/locations.
	Inappropriate solutions/services for given consumption patterns	Web-based monitoring of solutions; Automatic RFQ generation	Customized/current solution at best price; comprehensive dynamic market information
External organization	Little visibility into spending; impossible to compare bills across carriers, services	Bill aggregation across locations/ departments/carriers/services	Clarity on spending/consumption; aggregated volume for good negotiating
	Voluminous, incomprehensible telecom bills	Customized billing reports; Easy-to-use software interface	Clear, relevant, reports for corporate decisions; daily access to handy telemanagement tool
	Complex pricing contracts	Contract integration into system	Clarity into contract terms and implications for re-negotiation
	High perceived risk in trying new carriers or services	Ratings and references	Minimizes risk trying new providers/services; provides a credible comparison platform
	Overstaffed telecom management departments	Most comprehensive, online telecom management tool	Savings from reducing telecom-related human resources; Client can focus on core business

### **Entry and Growth Strategy**

Booleo will initially target companies in industries with the highest telecom spending per firm and the most compelling need for decision support. Its early acquisition of several large, well-known clients will provide excellent references for the company. The solution is being developed as a flexible and scalable model and will therefore be applicable to other markets and service categories.

**The Market**

**Customers**

Although Booleo’s value proposition appeals to all companies of all sizes, the relative value of different components changes within each segment, and Booleo has identified two different client segments.

- 1. **Tier 1:** Firms with monthly telecom expenditures averaging \$450,000
- 2. **Tier 2:** Firms with monthly telecom expenditures averaging \$100,000

**Market Size**

***Large businesses (Tier 1)***

This segment includes mainly S&P 2000 companies spending more than \$30 billion combined on telecommunications. Their average annual telecom spending can range from several million dollars to over \$500 million. Many of these companies are implementing e-procurement solutions and can clearly benefit from the addition of a telecommunications component. In general, the burning need of companies in this segment is to gain visibility into spending. As a result, CFOs and Controllers are critical targets for this segment. Tier 1 companies represent approximately **\$30 bn** in annual telecom spending.

***Medium-large businesses (Tier 2)***

A proxy to estimate the number of companies in this segment is the number of businesses with 250-999 employees. Target individuals are telecom managers and procurement managers, but other individuals such as CFOs are also critical. According to the US Census Bureau, there are approximately 40,000 firms in this segment with about 20 million employees. Based on IDC, Cahners In-Stat, and US Census Bureau data, and Booleo’s calculations, this segment represents about **\$20 bn** in annual telecom spending.

Below are estimates of telecommunications expenditures for Tier 1 and Tier 2 clients:

Customer Segment	Tier 1	Tier 2
Number of firms	6,441	41,592
Total spending by segment (\$mn)	\$30,176	\$19,365
Average Communication Spending per firm per year (\$)	\$4,685,032	\$465,590

**40 Tier 1 customers are required to break-even.**



It is worth noting that telecom consultants (telecom consulting is a large and growing market as outlined earlier in the thesis) are also likely future customers of the Booleo service.

### **Market Research**

Booleo conducted a web-based quantitative and qualitative market research survey of 200 telecommunications and IT managers from medium-sized companies using Zoomerang. Booleo also personally interviewed over 30 potential clients. The results of the market research confirmed a high level of client interest in Booleo. Details of the research are provided in Appendices A and B.

### **Competition and Competitive Advantage**

#### **Competition**

Booleo has identified several solutions in the market that address various pieces of Booleo's entire value proposition including offline cost reduction consultants, telemanagement firms, telecom portals, e-marketplaces, and procurement software providers. Booleo has also identified one company whose solution resembles Booleo's: QuantumShift. The barrier to entry created by QuantumShift's first mover position is quite low on the following two accounts. For one, QuantumShift's investment in intellectual property protection is not very obvious at least from publicly available information about the company. Secondly, they seem to be geographically confining their operations to the West Coast for the present. QuantumShift is discussed in greater detail later in this section.

Booleo offers a complete optimization solution relative to these other solutions because it:

- Aims at bringing process efficiencies within an organization at all levels of the internal procurement and management/ tracking chain
- Is easily implemented, especially for clients with existing e-management platforms
- Is an easy to use solution with minimal training required
- Provides unbiased access to ALL available providers
- Fully automates ALL time-consuming tasks and is an online, ongoing solution
- Focuses on telecom auditing while providing longer term strategy-oriented services
- Presents accurate selection/recommendation of services based on actual consumption

### ***Primary telecom consultants***

Telecom consultants in the US provide a variety of services ranging from cost reduction consulting to network integration and web hosting. Their customers are businesses of all sizes and their services are mostly off-line, one-time, and non-dynamic, and typically do not include bill aggregation or consolidation.

### ***Telecom Portals***

Many telecom portals and online telecom marketplaces such as Telezoo and TelecomExchange have emerged in the last few years, falling into two basic categories: auction aggregators and exchanges. These portals attempt to create efficiencies for high-end bandwidth providers and customers through the sale and provision of surplus bandwidth. However, clients make choices without aggregated consumption information. Furthermore, almost all telecom portal sites provide their services free to buyers and generate revenues in the form of commissions from providers for new customers switching providers, making them a less credible source for unbiased information.

### ***QuantumShift***

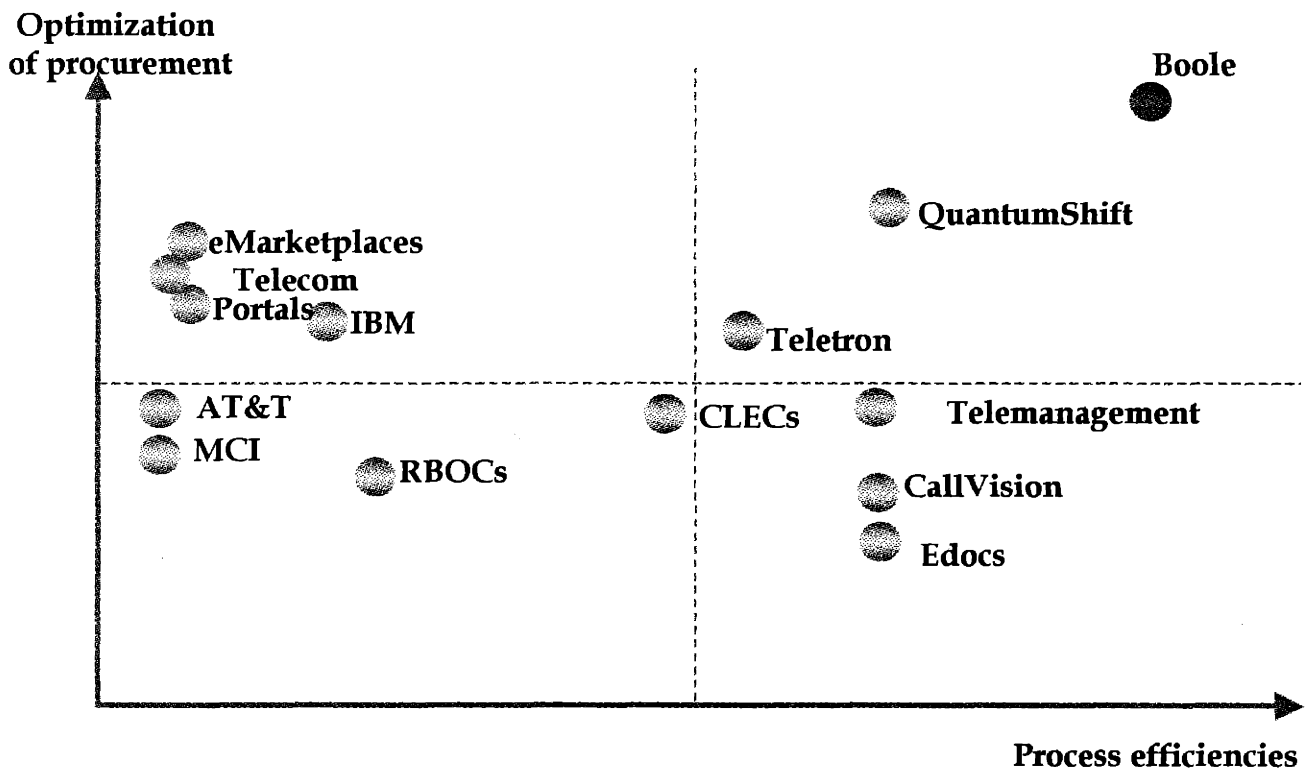
QuantumShift provides an online solution with a similar value-proposition to that of Booleo. It provides bill aggregation, network design and management, billing services, and sells telecommunications services. QuantumShift has about 60 customers and has received over \$100 million in three rounds of funding. An enterprise system, QuantumShift's solution requires a reasonable implementation time (roughly a month for a mid-sized firm according to QuantumShift's website) including formal, in-depth training. QuantumShift requires that clients completely outsource their telecom departments and management to them. Though this is possibly the way of the future, at present client companies, especially the mid and large-sized companies that both Booleo and QuantumShift target are not comfortable with the idea of relinquishing internal control on telecommunications management to an unproven third party. This finding is corroborated by the Booleo team's market research and customer interviews. Also, it is interesting to note that though QuantumShift has been in business for 3 years, probably due to their outsourcing requirements and moderately high subscription fees (\$2500 to \$15,000 per month from the QuantumShift web site), they have no name brand clientele.

A detailed table of perceived potential competition is in Appendix C1.

**Mapping the competitive environment**

The following figure describes the competitive market environment as viewed through the process of purchasing telecommunication services and with respect to the players within the market. This shows that the Booleo solution covers the bill aggregation and analysis, and the optimizing purchase order parts of the process. Booleo’s solution will also cover the desktop requisitioning part of the process and it can potentially be integrated with existing solutions such as Ariba or CommerceOne. A map of the supply chain can be found in Appendix C2.

The matrix below attempts to map competition as perceived by Booleo:



**Sources of Competitive Advantage**

1. **Patent Protection** - Booleo has filed a business process patent that will provide intellectual property protection to the solution. The patent will also cover the software developed for the full launch expected in mid-2001. The patent has been filed with Wolf, Greenfield, and Sacks – the premier intellectual property law firm in Boston, MA. Claims on the patent will be written after the full software is developed since this will provide more comprehensive

protection and be more attuned to the functionality built into the product. The legal cost for writing the claims is estimated at \$25,000.

**2. Proprietary software** - Booleo is currently designing proprietary software that will be covered by the business process patent. Since the functional scope and logic of the product are unique, there will be minimal usage of off-the-shelf software to build the full solution. This will also ensure that the product is hard to replicate and thereby provide a strong barrier to entry. The logic for the analysis of telecom bills is being carefully designed using the input given by Booleo's telecom consulting partners.

**3. High switching costs for customers** – Given Booleo's access to all client telecom bills, a client leaving Booleo for a direct competitor would face two major issues:

- The loss of all profiling and consumption information and Booleo analysis: This is perhaps the most serious implication for a client when switching to a competitor of the Booleo solution. While the Booleo client continues to own the billing information received from carriers, all the analysis from the consolidated bills achieved through usage of the Booleo solution over time belongs to Booleo, and will be lost to the client if they choose to switch to a competitor. Given the usefulness of this historical information and the expense and time involved in accumulating it, Booleo anticipates that this will create high switching costs for its clients.

Our market research reveals that client companies are unaware of any competitors to Booleo today. Given this situation and the fact that potential competitors are unlikely to come with low exit barriers themselves, it is probable that clients will be inclined to sign up with Booleo, fully aware of the switching costs. It would be advantageous from this standpoint for the customer to sign a long-term (3-years or so) contract with Booleo. Such a contract will serve as a credible commitment on Booleo's part to not raise prices and exploit the customer's high switching costs.

- The logistical and legal overhead of re-routing all telecom bills: There is significant legal and logistical overhead involved in re-routing telecom bills from carriers to a Booleo competitor. This overhead increases with the size of the client, their geographical dispersion, and the number of telecom carriers used by them.

Given the unprecedented value that Booleo will provide its customers, it is confident of maintaining an excellent client retention record.

**4. Capitalizing on early mover advantage by locking customers in** - Very few competitors cover all elements of Booleo's extensive value proposition. As a result, it is a very early

mover in the telecommunication procurement space. Booleo will offer the service in a phased manner with new and modular services added in each phase that progressively increases the value proposition and credibility with clients. The high exit cost for existing clients helps Booleo capitalize on its early mover advantage and translates it into a competitive advantage.

5. **Client-side credibility** - Few competitors to Booleo are client-sided and earn all their revenue from clients instead of providers. Companies that resell services and partner with providers to earn transactional switching revenues undermine their credibility as client-side procurement agents. Booleo is a client focused, unbiased agent.
6. **User-friendly solution** - Booleo has invested heavily in making the solution user-friendly. Tremendous attention has been paid to the design of the web interface for end-users. Several features that make the site user-friendly such as minimizing the number of clicks to access data, color coding of different functions, navigation that is easy to master and remember, graphical representation of data where applicable etc. have been incorporated. There is minimal user training required to begin using Booleo. Such a solution, accessible to individuals and companies of all technical abilities, provides Booleo with a tremendous market advantage.

## **The Economics/Financial Prospects**

### **Revenue Model**

The Booleo revenue model is based on a multi-part tariff.

- 1) One-time, set-up fee based on the complexity of the client's current telecom solution and a percentage of the projected savings to be brought to the client (flat for Tier 1 clients)
- 2) Flat monthly subscription fee based on the company's level of monthly telecom expenses
- 3) Per-use fee for detailed recommendation and pricing reports (mainly Tier 2 clients)

This leads to \$21.0 million in revenues, 100 subscribers, and breakeven in 2002.

### **Pricing**

Clients will be charged a one-time setup fee and a flat monthly subscription fee. This allows them to access the secure client website and have unlimited access to all information regarding their telecom accounts as well as information relevant to their services. While customers will be charged per use fees for detailed recommendation and pricing reports, features such as the

RFQ generator will be accessible at no extra charge. Additional features to be added in later versions may incur additional charges.

Client	Tier 1	Tier 2
Set-up fee	\$500,000 on average	Approx. 30% of projected 15% savings/ approx. \$20,000
Monthly subscription	\$20,000	\$1,500

*For Tier 2 customers only, 15% savings assumption:* Reviews of bills one of Booleo's beta clients and current provider offerings suggest a savings of up to 30%. Cost reduction consultants and QuantumShift also claim to offer up to 30% savings. While we are confident that Booleo can be equally if not more attractive to clients in terms of savings compared to our competitors, we have opted to be conservative in our projected financials presented to investors where we assume a savings of only 15% (i.e., minimum savings achievable).

### Operating Margins

Booleo's revenue model is based on fees from customers, leading to pre-tax margins around 30%. The table below shows detailed financial projections for Booleo:

	2001	2002	2003	2004
Telecom Expenses under Management	7	39	100	209
Number of subscribers	19	109	273	558
Tier 1	1,820	17,952	35,100	72,580
Tier 2	444	3,078	6,934	13,223
<b>Total Revenues</b>	<b>2,264</b>	<b>21,029</b>	<b>42,034</b>	<b>85,803</b>
Salaries	5,291	13,308	22,702	38,421
S,G&A	4,458	6,421	5,026	9,324
<b>Net Income</b>	<b>(7,485)</b>	<b>1,301</b>	<b>9,586</b>	<b>25,500</b>
Margin	-331%	6%	23%	30%

### Fixed, Variable, and Semi-variable Costs

Booleo's fixed costs include software development, servers and hosting, content writing, pricing database filling and maintenance, overhead salaries, general expenses and headquarters expense. Variable costs per client include customer acquisition cost (sales and marketing),

storage, content verifiers and customer support. The cost breakdown per client segment per subscriber is presented in appendix E.

### **Months to Breakeven**

Booleo should break even by the end of 2002 provided it receives funding by January 2001. Its months to break-even are comparable to its months to cash flow break-even since its assets are not typical assets depreciated over time and its working capital requirements are expected to be stable over time (clients pay monthly).

### **Marketing Plan**

#### **Marketing Strategy**

Given the huge opportunity for increasing efficiency in telecom expense management processes and the variety of solutions available today, Booleo must clearly explain the problems it solves and how it solves them. The existing confusion about telecommunication services, while creating a tremendous opportunity for Booleo, also makes it harder for Booleo to differentiate itself clearly from alternate solutions. Booleo must raise brand awareness of its product and services, making its message as clear and simple as possible. As a result, the first step of the Booleo marketing strategy is customer education and the creation of market demand.

#### ***Education***

Web seminars: Booleo will offer web seminars to demonstrate Booleo to a targeted audience of telecom managers and CFOs.

Demos: Booleo's website features an easy-to-understand demo, illustrating Booleo's clear and logical user interface. This demo will be critical in attracting clients to sign-up for service.

Telemarketing: The Booleo telemarketing sales force will use the demo with potential clients.

Conferences: Booleo also intends to make presentations at popular telecommunications-related conferences that are attended by telecom procurement managers from our target market. In this regard, it is worth noting the Joseph Yacura (Booleo Advisory Board Member and Board Member of the Wall Street Technologies Association) has offered the Booleo team presentation opportunities at the upcoming half-yearly conference of telecom managers for Wall Street companies in New York. Such a venue provides an ideal sales platform for Booleo.

### ***Brand awareness***

Reference customers: Public visibility is essential to building a positive reputation and a client base, so Booleo will focus initially on acquiring Tier 1 clients to serve as references for selling to Tier 2 clients.

Partnerships: Booleo intends to partner with a financial institution that has access to CFOs. This will raise awareness on Booleo by leveraging the partner's telemarketing sales force and its direct mail efforts.

Web marketing: Booleo's web marketing strategy is mainly to target sites and portals providing e-management platforms such as Ariba portals, or e-procurement platforms such as MarketMile.

Articles: Booleo will publish white papers and articles that clarify its competitive positioning.

### ***Qualified leads***

Target list of customers with existing e-procurement solutions: Booleo will try to use the network effect created by existing e-procurement systems and will target those customers that already have these solutions in place at the outset. It will try to sell its services as an add-on to an existing Ariba or CommerceOne platform. The Booleo team has gained valuable introductions to Ariba through its advisory board members, but considers it too early to act on these leads given the early stage of the company.

Referrals from partners and existing customers: Established partnerships will also help generate qualified leads. In addition, existing customers will be given incentives to provide referrals to Booleo.

### **Sales and Distribution**

Booleo's sales strategy will be closely tied to its marketing initiatives. Booleo perceives understanding of customer needs and ensuring customer satisfaction as critical to its success. As a result, a direct sales model prevails in its sales and distribution strategy. There are also two distribution channels that could, however, increase the efficiency of the Booleo sales model.

#### ***Direct sales force: 1 deal a week, 90-day sales cycle***

Booleo's direct sales force is critical to establishing "personal" relationships with clients and will be used primarily for targeting Tier 1 clients. An inbound sales force will support inquiries generated by advertising and promotions, and will field inbound calls and web requests. Initial sales efforts will be conducted out of the Boston location, but eventually Booleo will open regional sales offices.



### ***Distribution channel 1: Consultants***

Booleo will also partner with telecom consultants and network design consultants on a referral or success fee basis. Consultants such as Arthur Andersen, PWC or Deloitte that are currently involved in telecom and other cost-cutting consulting work with clients can use the Booleo solution to their advantage. The automated solution can facilitate data analysis and minimize the labor-intensive aspects of their work. Since their sales models are heavily focused on direct contact with existing and potential clients, their existing relationships will be an asset to Booleo. If provided strong revenue-sharing incentives, these partners could generate significant sales for Booleo.

### ***Distribution channel 2: package Booleo with an existing e-platform***

Ultimately, clients like to implement one solution that takes care of all of their non-core purchases and manages all related processes. Booleo, responding to this trend, and thanks to its open architecture, can be included in such a package (like Ariba) attending to all procurement and process management needs.

## **Technology, Development, and Operations**

### **Development Status and Schedule**

The Booleo team created and validated the Booleo process flow and technical architecture with several web design firms and the technical talent on the Advisory Board. The emphasis has to been create a highly open architecture that is designed to be Ariba-compatible. The prototype with representative functionality has been developed and the Booleo team is currently in the process of testing it with beta clients. The prototype development work was out-sourced to Tank Hill, a San Francisco development firm and was completed at a cost of around \$25,000.

Booleo is in the process of recruiting a full-time CTO and will develop the full solution under his/her guidance in-house. The developed software will be proprietary to Booleo and will be covered by the pending patent. After obtaining additional funding, full product development will be initiated (expected to be around December 2000). Software development and quality testing is expected to take 4 to 6 months and full launch of the product is planned for mid-2001. The full solution is expected to cost around \$2 million.

The Booleo process flow is a cycle of the following three steps:

1. Extraction, aggregation, and normalization

Booleo will extract telecom consumption-related information from different levels (employee, cost center, and telecom management levels) through an online requisitioning system. The procurement objectives and contractual details with current providers will be aggregated across the different sites of the company to drive optimization in procurement. On the billing side, all client bills obtained from the client/provider will be translated into a standard electronic format. Both pieces of information (bills and procurement objectives) constitute the *client profile information*. Finally, pricing plans from providers obtained dynamically from firms like the Center for Communications Management (CCMI), web-sites, online marketplaces, the FCC, or through RFPs, will be aggregated into a repository.

2. Intelligent multi-criteria search-match analysis

Client profile information will be matched with Booleo's dynamic database of providers' current services and prices. This will result in customized procurement recommendations. By going down to the employee level in future versions, the quality of analysis of the Booleo engine is vastly improved. At the cost center level, the client organization can derive benefits from call bill-back revenues as well as being able to identify employees that have left the company and whose telecom services need to be terminated.

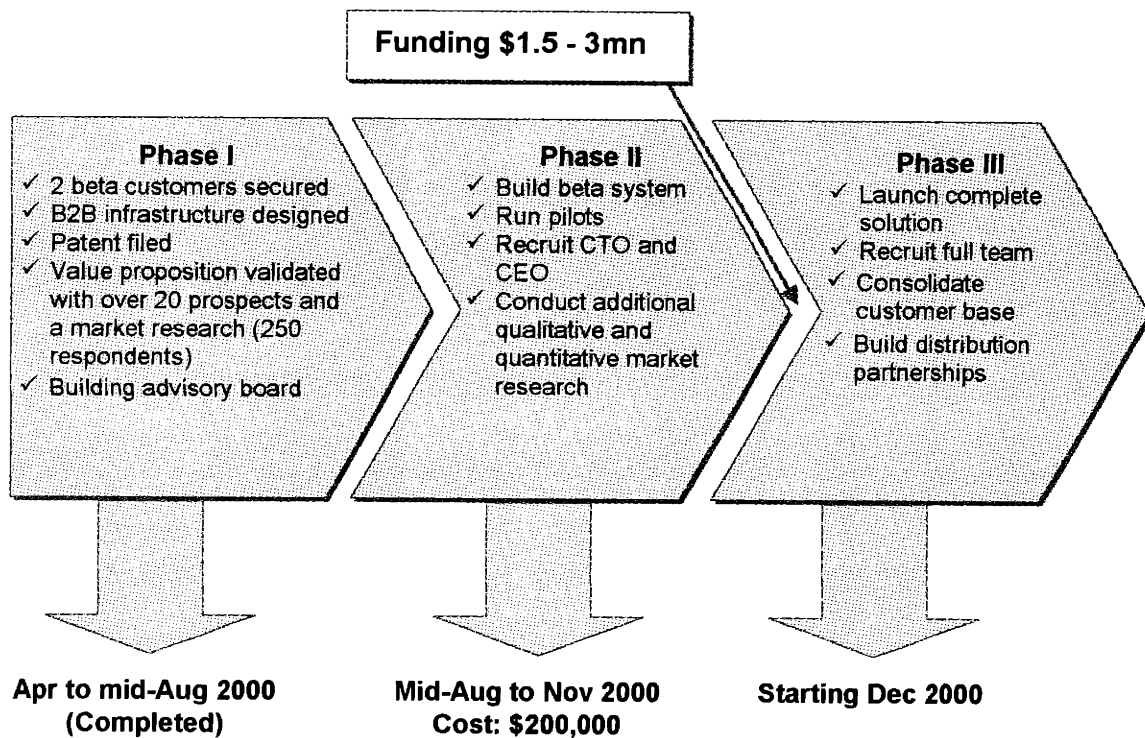
3. Advice and recommendations

Booleo can provide the client with procurement recommendations and finite action steps for improving the current telecom solution and for renegotiating contracts with providers.

A diagram of the technical architecture mapping the Booleo process flow is available in Appendix F.

### **Overall Schedule**

The Booleo team has exceptional execution skills and has achieved significant milestones to-date. The schedule of activities is presented in three phases based on work completed before angel funding, work completed between the first and next rounds of funding, and work that will be initiated and completed after such funding is obtained.



The main uses of funds raised between phases 2 and 3 are outlined below.

1. Full product launch: Booleo intends to have the full product built in-house with the development lead by a CTO and a team of developers. The core product development is expected to take about three months.
2. Large-scale recruiting to fill senior executive and other positions: One of the main focus areas in phase 3 will be recruiting to fill the many core positions in the company. A possible future organization chart for Booleo is presented in Appendix D.
3. Establishing client base: Booleo will work on solidifying its client base. The effort will be geared towards selling to large, reference clients.
4. Establishing distribution partnerships: Distribution channels through national financial firms, supplies companies, and affiliate networks on the web will be established. Incentive strategies to drive customer acquisition will be developed and implemented.

## Operations

The operations specific to each of the 3 process steps are detailed below:

### **Step 1: Data aggregation**

The Booleo system will aggregate and maintain data for the following repositories:

- a) Billing Repository: Contains all the billing information for clients obtained from consolidating their bills from different providers and locations.
- b) Technical Solutions Repository: Contains information on feasible and current technical telecom solutions pertinent to Booleo's clients.
- c) Pricing Plan Repository: Contains all dynamic market information on providers' pricing plans.
- d) Customer Procurement Objectives Repository: Contains each client's stated procurement objectives at different levels within the client organization.
- e) Provider/Service Ratings Repository: Booleo will offer clients access to a ratings database where they can enter and view rating information on providers and services.

***Step 2: Analysis***

The search and match engine is an intelligent engine that pulls together inputs from the five repositories, namely aggregated billing, technical telecom solutions, pricing plans, procurement objectives, and carrier ratings. The output is a list of recommendations that the client can view.

***Step 3: Advice/Recommendations***

When the client selects a recommendation from those listed, a display of some of the supporting information will be made available. At this point, the client can also request a more detailed recommendation report from Booleo that will be charged and provided on a per request basis.

## **Conclusion**

In summary, we present the highlights of each of the four sections of this thesis.

At the outset, we embarked on a market survey of telecommunications managers at US companies. The survey results clearly proved that telecom managers were finding service and expense management increasingly complex and that they would welcome an unbiased, third party to help them in these tasks. The deregulated and dynamic telecom environment, complex telecom bills, and the geographical dispersion of client companies were all factors that contributed to the challenge of managing telecommunications for large businesses. Gaining visibility into consumption and therefore costs has assumed critical importance at these businesses given the increasing reliance and expenses on telecommunications for any firm.

In section two, we used a case study of telecom management at Manulife Financial to provide a real-life example of the issues discussed in the prior section. Process redundancies, labor-intensive expense management tasks, and frustrations in carrier dealings were among the main problems revealed by analysis of this case.

In the third section, we looked at the concept of supply chains in service settings and the role of information flows facilitated by technological advances such as the Internet for service supply chains. The telecommunications service supply chain was then analyzed in detail, specifically in the context of US businesses rather than consumers as end-customers. All the different segments of the telecom supply chain, the players, competition, and information flows/gaps were discussed. This exercise revealed the potential opportunity for a new web based service that would serve primarily large business clients and fill many of the information gaps perceived earlier in the section.

The fourth and final section was a detailed business plan to implement the web-based service – Booleo, introduced as a concept at the end of section 3. The value proposition of the business, market potential and size, sales and marketing models, revenue model and financials, operations and technology were all presented in this business plan section.

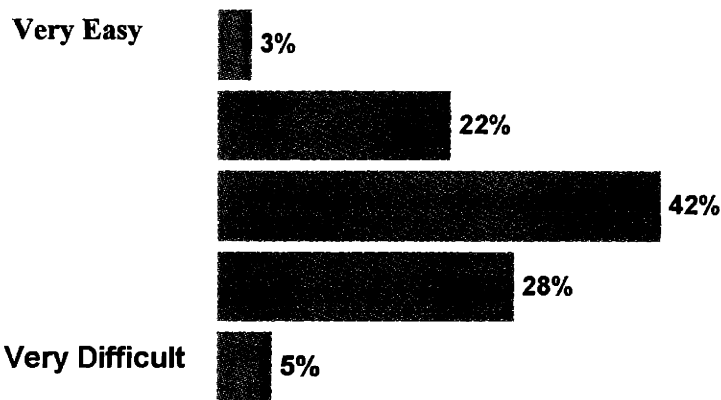
Although the problems facing US businesses in managing telecommunications services and expenses are real and complex, they also present significant cost-saving opportunities to these companies when using Booleo's solution.

**APPENDICES:**

**Appendix A: Market Research**

□ Booleo conducted a web-based market research survey (using the market research firm Zoomerang) where 200 respondents (all telecom managers or people responsible for purchasing telecommunication services at medium sized companies) answered queries pertaining to telecom management.

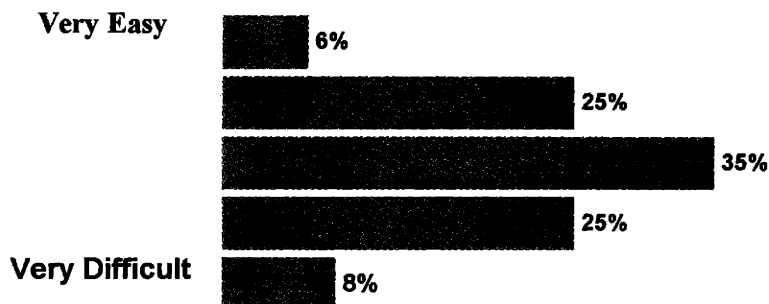
❖ In general, how difficult you think it is to understand different technical telecommunication solutions (example: DSL vs T1, Interstate vs Intrastate, local area, analog vs digital, wireless coverage, call centers, VPN, frame relay etc.)?



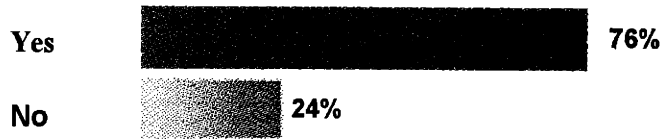
❖ Do you think unbiased help is required to make informed decisions about the best telecommunication solution for your business?



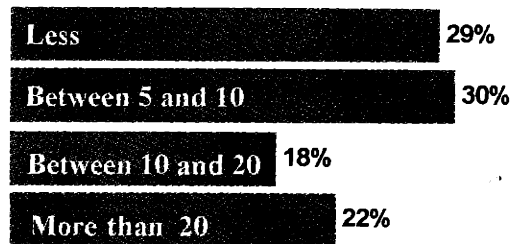
❖ How difficult do you think it is to clearly understand the pricing of telecom solutions provided by telecom carriers such as AT&T, Sprint, MCI, Qwest etc.?



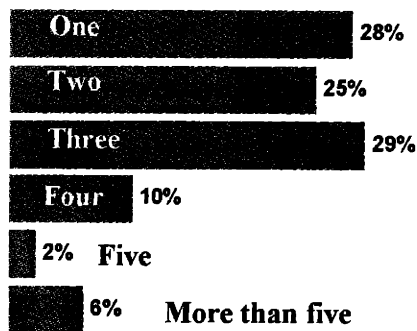
- ❖ Do you think unbiased help is required to compare the quality and price of different telecom carriers for your business?



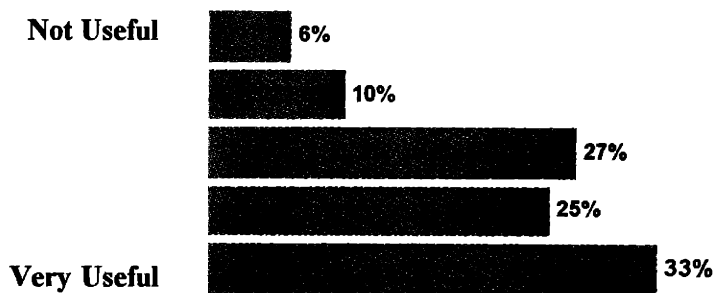
- ❖ How many Telecom carriers/ providers do you think there are in the market that are able to provide your business with its current telecom solution?



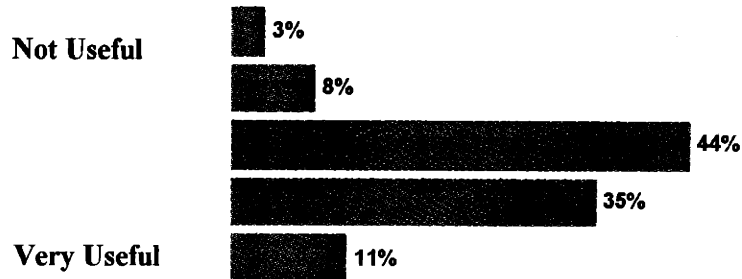
- ❖ How many telecom carriers currently provide your business with the different telecommunication solutions required to do business (data communications, long-distance, local, call center, mobile phone, toll free numbers etc.)



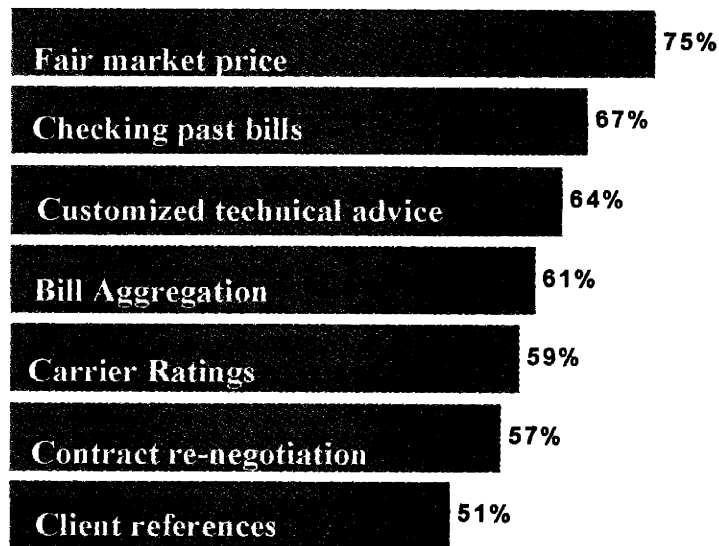
- ❖ What would you think of a single bill aggregating all your telecom carriers/ services each month, that would be sent to you electronically?



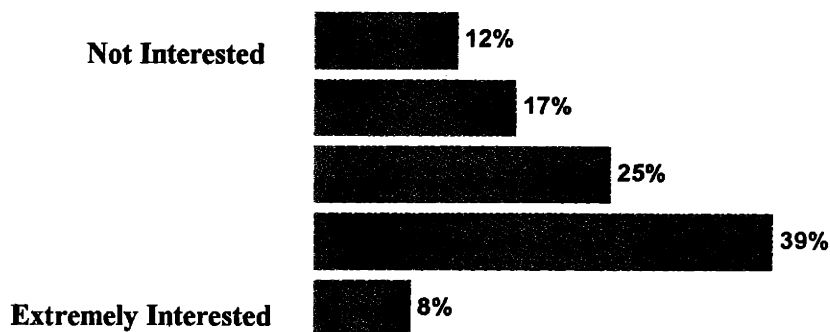
- ❖ Select what rating comes closest to best describing how you feel about the described service.



- ❖ Please rate the features below in importance to you. List of top items found "very important."



- ❖ Overall, how interested are you to buy this service if it's available?





## Appendix B: Quotes from Potential Clients and Partners

Potential Client or Partner	Response
<b>Dean Haacker</b> Director, B2B Mobile Commerce, <b>Motorola</b>	<i>"Managing monthly bills is a great idea. It is a real headache and not much is happening to support businesses. A tool to more strategically manage recurring expenses is more valuable than just finding the lowest cost... I think you have the right timing and the right concept."</i>
<b>David Minori</b> US Telecom Manager, <b>Manulife Financial</b>	<i>"Our procurement objectives are not focused only on price. We are equally if not more interested in procurement advice and process efficiency."</i>
<b>Michael Morris</b> IT Manager, <b>Wolf, Greenfield and Sacks</b>	<i>"I need support when making a telecom decision, someone who would bring decisions to the last mile, and put together all the information to make the right decision. I want to avoid having to gamble when comparing different pricing structure and know what are the most appropriate telecom services for my firm."</i>
<b>Don D'Avignon</b> , Telecom Procurement Manager, <b>American Express</b>	<i>"You have chosen a sweet spot in the telecom industry that has tremendous potential."</i>
<b>Bill Reed</b> , Corporate Development Executive, <b>Sprint</b>	<i>"Providers are always looking to expand their distribution network and will be more than willing to provide accurate pricing information through channels like the consultant-liaison program."</i>
<b>Richard Alston</b> , Former Head of Marketing at <b>Bell Atlantic</b>	<i>"All major telecom providers today issue electronic bills and it should be easy for you to gain access to this information."</i>
<b>AT&amp;T Account Manager</b> , <b>Digitas</b>	<i>"The cost of losing a customer is just infinite. It cannot be compared to anything, and any price to retain a customer is worth it."</i>

**Appendix C1: Booleo's Competition and Competitive Analysis**

Firms	CHOICE								
	Ongoing Solution	Online solution	Customized solution	Neutrality	Sells Services	Bill Aggregation	Contract renegotiation	Technical advice	Network design
Booleo	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
QuantumShift	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>
Teletron	-	-	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	-	-
Omnichoice	-	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-	-	-
Callvision	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-	-	-
Telecompare Swift River	-	-	<input type="checkbox"/>	-	-	-	-	-	-
Winbill	-	-	-	<input type="checkbox"/>	-	<input type="checkbox"/>	-	-	-
Cymbia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	-	-	-
StoneHouse	-	-	<input type="checkbox"/>	-	-	-	-	-	-
Telcoexchange	-	<input type="checkbox"/>	-	-	<input type="checkbox"/>	-	-	<input type="checkbox"/>	<input type="checkbox"/>
Telezoo	-	<input type="checkbox"/>	-	-	<input type="checkbox"/>	-	-	-	-
Decide	-	<input type="checkbox"/>	-	-	<input type="checkbox"/>	-	-	-	-
Simplexity	-	<input type="checkbox"/>	-	-	<input type="checkbox"/>	-	-	-	-
BuyTelco	-	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	-	-	-	-
TelecomRF Q	-	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	-
Telcoonline	-	<input type="checkbox"/>	-	-	<input type="checkbox"/>	-	-	-	-
Onvia	-	<input type="checkbox"/>	-	-	<input type="checkbox"/>	-	-	-	-
Essentials	-	<input type="checkbox"/>	-	-	<input type="checkbox"/>	-	-	-	-
Demandline	-	<input type="checkbox"/>	-	-	<input type="checkbox"/>	-	-	-	-
Telephone	-	<input type="checkbox"/>	-	-	<input type="checkbox"/>	-	-	-	-
AIG Telecom	-	<input type="checkbox"/>	-	-	<input type="checkbox"/>	-	-	-	-

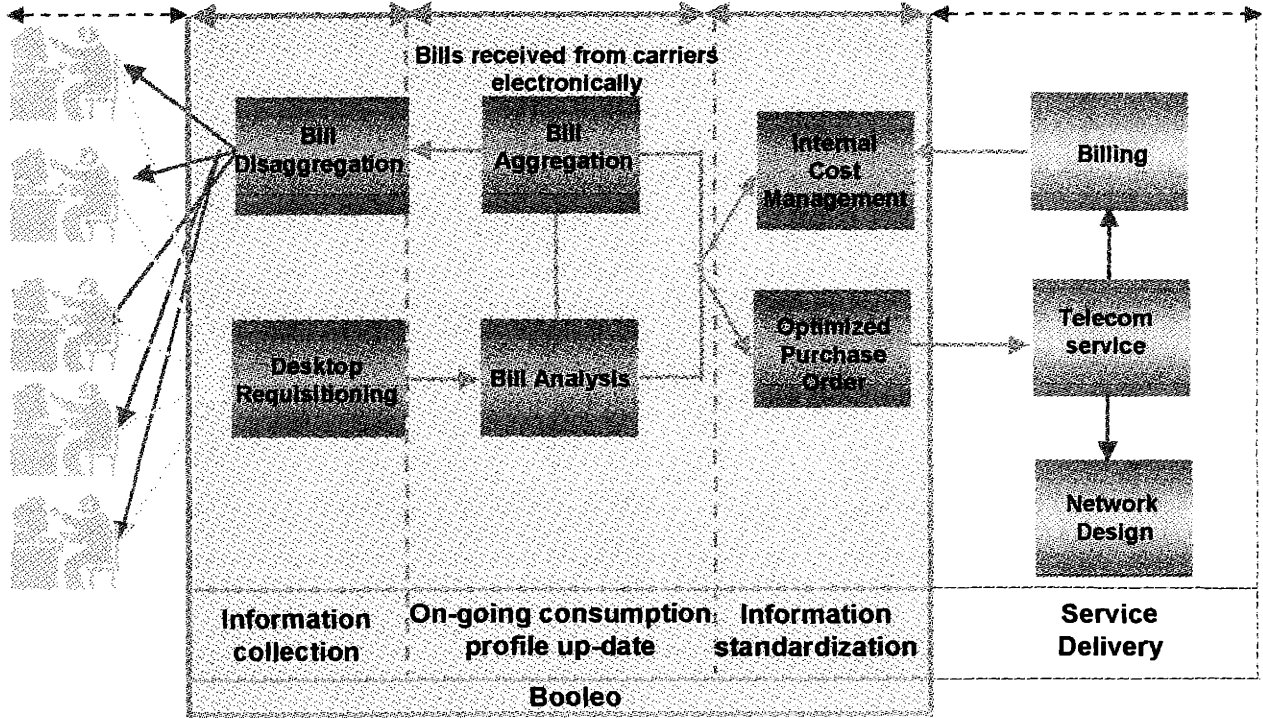
Firms	Time		Price				Comments
	Process efficiency	Online Billing	Bill Auditing	Pricing advice	Sells telecom equipment	Revenue Model	
Booleo	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	Subscription and transaction-based	
QuantumShift	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	Subscription fee (\$2,500 to \$15,000)	
Teletron	-	-	<input type="checkbox"/>	<input type="checkbox"/>	-	Paid as telecom consultants	Consulting
Omnichoice	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	Transaction-based	
Callvision	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-		+ software
Telecompare Swift River	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	-	Software purchase + telecom consultants	software solution
Winbill	-	-	<input type="checkbox"/>	-	-	Software purchase	software solution
Cymbia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-		ASP
StoneHouse	-	-	<input type="checkbox"/>	-	-	Paid as telecom consultants	+software
Telcoexchange	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	Transaction- or fee-based	Bandwidth
Telezoo	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	Fees from providers	Datacommunication + RFQ
Decide	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	Transaction- or fee-based	Datacommunication + RFQ
Simplexity	-	-	-	-	-	Transaction- or fee-based	A trading hub
BuyTelco	<input type="checkbox"/>	-	-	-	-	Transaction- or fee-based	Datacommunication + RFQ
Telecom RFQ	-	-	-	-	<input type="checkbox"/>		Datacommunication + RFQ

Telcoonline	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	Fees from providers	Datacommunication + RFQ
Onvia	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>	Transaction- or fee-based	Datacommunication + RFQ
Essentials	-	-	-	-	-	Transaction- or fee-based	Pooling
Demandline	-	-	-	-	-	Transaction- or fee-based	Pooling
Telephone	-	-	-	-	<input type="checkbox"/>	Transaction- or fee-based	auction/ comparison bids/ sales + Pooling
AIG Telecom	-	-	-	-	-	Transaction- or fee-based	Pooling

Firms	Risk			Other				
	Minimize switching risk	Provider ratings	Customer reference	Patent protected process	Average growth/year	Target	Size	Location
Booleo	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		Medium-sized businesses		Boston, MA
QuantumShift	<input type="checkbox"/>	-	-	-	25 % in revenues /month	Mid- to large-sized businesses	40 clients avg. +6 each month	Novato, CA
Teletron	-	-	-	-	sales +100% per year	Small to large Businesses		Bloomington, IN
Omnichoice	-	<input type="checkbox"/>	<input type="checkbox"/>	-		Households, but soon to businesses		Wayne, PA
Callvision	-	-	-	<input type="checkbox"/>		Carriers		Seattle, WA
Telecompare Swift River	-	-	-	<input type="checkbox"/>		Telecom consultants and		NH

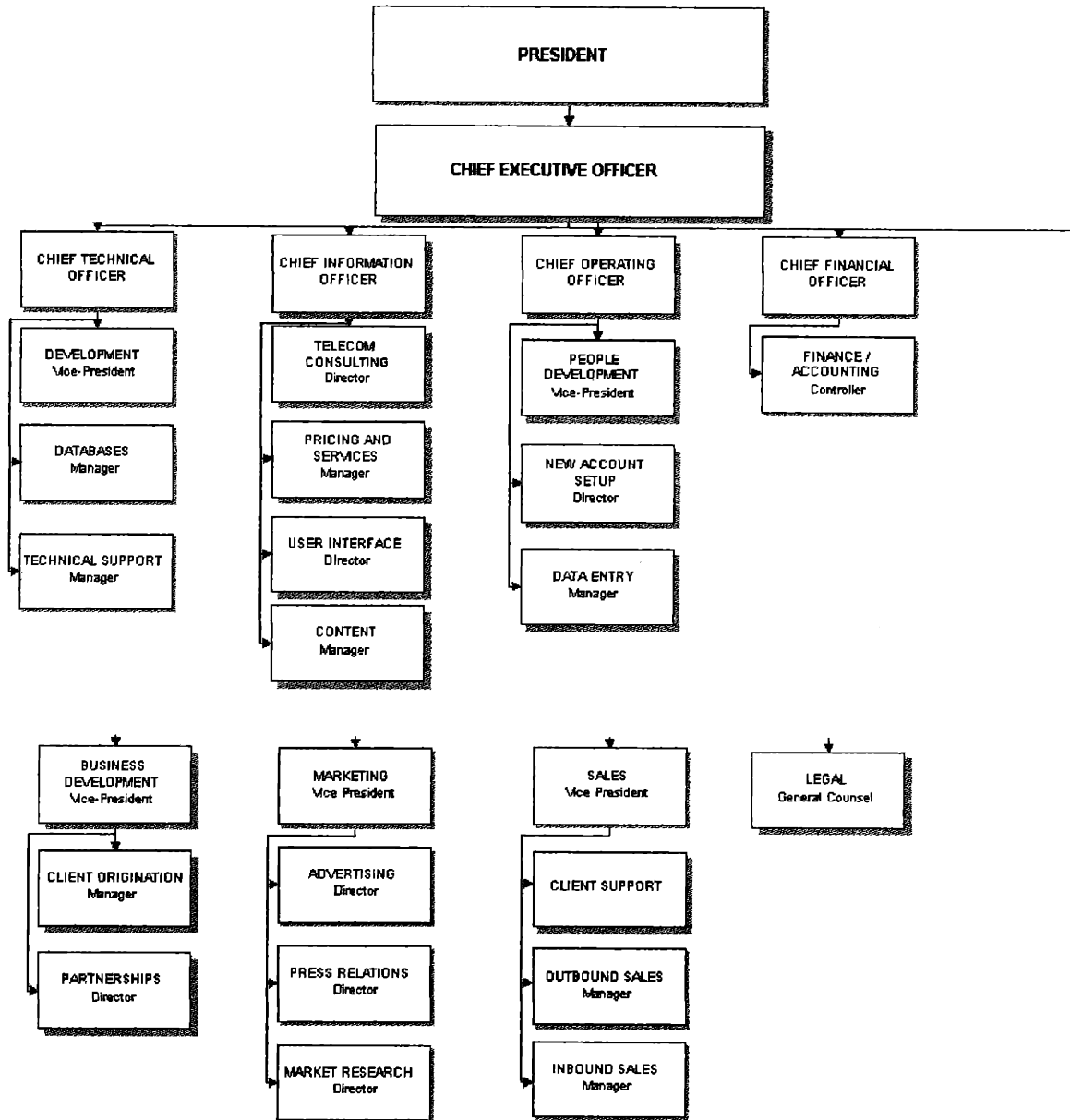
						managers		
Winbill	-	-	-	□		Businesses		Walnut Creek, CA
Cymbia	-	-	-	□		Businesses		Austin, TX
StoneHouse	-	-	-	-		Mid- to large-sized businesses		Dallas, TX
Telcoexchange	-	-	-	-		Telecom carriers and large companies.		VA
Telezoo	-	-	-	-		Small to medium Businesses		Arlington, VA
Decide	-	-	-	-		Anyone		Santa Clara, CA
Simplexity	-	-	-	-		Businesses		Herndon, VA
BuyTelco	-	-	-	-		Businesses		Washington, DC
Telecom RFQ	-	-	-	-				
Telcoonline	-	-	-	-		Small to large Businesses	Agency agreements with carriers	Seattle, WA
Onvia	-	-	-	-		Small Businesses	475 employees	Seattle, WA
Essentials	-	-	-	-		Businesses		Burlington, MA
Demandline	-	-	-	-		Small Businesses		San Bruno, CA
Telephone	-	-	-	-		Anyone		Atlanta, GA

**Appendix C2: The telecom services supply chain**



## Appendix D: Organization

The following is a possible organization chart for Booleo in 2001.



**Appendix E: Revenues and costs per subscriber**

<b>Segment</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>
<b>Tier 1</b>				
Number of subscribers	3	26	65	142
Average set-up fee	500,000	500,000	500,000	500,000
Average monthly subscription fee	20,000	20,000	20,000	20,000
Per usage fees per year	0	0	0	0
Total revenue per subscriber excl. set-up fee	240,000	240,000	240,000	240,000
Cost per sales person				
Cost per Customer service rep.	81,333	10,417	6,256	3,169
Cost per recommendation check	18,068	1,790	716	328
Overhead (including marketing & installation)	n.m.	n.m.	n.m.	n.m.
Total Cost per subscriber	2,164,292	397,902	194,980	129,286

<b>Tier 2</b>				
Number of subscribers	17	83	208	416
Average set-up fee	19,729	21,248	21,864	23,866
Average monthly subscription fee	1,500	1,500	1,500	1,500
Per usage fees per year	2,000	2,000	2,000	2,000
Total revenue per subscriber excl. set-up fee	20,000	20,000	20,000	20,000
Cost per sales person				
Cost per Customer service rep.	14,666	3,667	533	587
Cost per recommendation check	2,798	560	86	49
Overhead	213	213	213	213
Total Cost per subscriber	167,583	62,184	12,072	9,994



**Appendix F: Technical Architecture Diagram for Bill Aggregation and Analysis**

